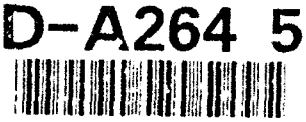

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Commander's Critical Information Requirements (CCIR):

Reality Versus Perception

A Monograph
by
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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term AY 92-93

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1992	MONOGRAPH

4. TITLE AND SUBTITLE
COMMANDER'S CRITICAL INFORMATION REQUIREMENTS (CCIR): REALITY VERSUS PERCEPTION

5. FUNDING NUMBERS

6. AUTHOR(S)

MAJOR MICHAEL R. BAREFIELD

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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(COMM) (913) 684-3437 AVN 552-3437

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

SEE ATTACHED

14. SUBJECT TERMS

CCIR	EEFI	DECISION MAKING	INFORMATION
PIR	FFIR	COUP D'OEIL	COMMAND AND CONTROL
DOCTRINE		LEADERSHIP	BOUNDED RATIONALITY

15. NUMBER OF PAGES 55

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNLIMITED

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MONOGRAPH APPROVAL

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Title of Monograph: Commander's Critical Information Requirements (CCIR): Reality Versus Perception?

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Accepted this 19th day of December 1992

Accesion For	
NTIS CRA&I	☑
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and / or Special
A-1	

ABSTRACT

COMMANDER'S CRITICAL INFORMATION REQUIREMENTS (CCIR): REALITY VERSUS PERCEPTION? by MAJ Michael R. Barefield, USA, 55 pages.

The purpose of this monograph is to determine if current and emerging doctrine adequately defines and describes CCIR so that it can be a usable tool for future battle commanders.

The monograph first analyzes the doctrine for the use and communication of CCIR found in current U.S. Army field manuals. The monograph then examines the concept of "bounded rationality" and its effect upon the mind of the commander in determining CCIR. Next, the monograph examines how recent commanders of U.S. Army corps and divisions designated certain essential information and the effect that technology had on their focus. Lastly, the monograph critiques emerging doctrine using the specific lessons of bounded rationality and history.

The monograph concludes that the development of any doctrine is a dynamic process. Doctrine must study the lessons of the past and combine the lessons learned with the capabilities of the future in a disciplined evolution. The emerging doctrine for CCIR is a start in the right direction. However, it is not yet complete and is misleading in its call for control of information versus command of it. The monograph gives recommendations for use in correcting and refining the doctrine before distribution to the field.

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INTRODUCTION

> Many commanding generals only spend their time . . . in making their troops march in a straight line, in seeing that they keep their proper distances, in answering questions which their aides de camp come to ask, in sending them hither and thither, and in running about incessantly themselves. In short, they try to do everything and, as a result, do nothing.
>
> de Saxe, My Reveries [1]

Modern technology has drastically altered the environment in which men prosecute war, thereby creating new or revised leadership challenges for the tactical commander.[2] This technology has increased the information available to the commander and decreased the time available to him for decision making.[3] As a result, commanders as a rule have not learned how to limit the information fed to them. They do not know how to separate the information critical to mission accomplishment from the volumes of information available.

Although the technological capabilities used in command and control systems have increased the availability of detailed information, the human capacity to assess the value of information and make a decision has not evolved at the same rate. The result is that technological performance has outpaced decision making performance.

Today, information transmission and processing occur faster, through multiple means, over any

distance, and despite any type of weather.[4] The machines and systems that do this look impressive, with colorful lights and fascinating functions. However, they have been unable to establish a critical path for a commander to follow through the volumes of information that create a clear mental vision of the battlefield and illuminate what is important to that vision.

Throughout the history of warfare, great captains were able to see the battle clearly, despite abundant information, the stress of combat, and a lack of modern technology. They used their mind to create a mental picture of the battle and to establish and discern informati ı important to that picture.

The human mind has not changed very much over time. Perceptions, memories, and intuitive and analytical skills determine the mind's character and capabilities. Just as the human body has limits as to its physical endurance under the stress of labor, the human mind has cognitive limits as to what it can absorb during the decision making process of combat. There is an optimum amount of information that a commander's mind can comprehend before it is overloaded.[5] Once the volume of information passes that optimum amount, the mind decreases in its decision-making capabilities.

Despite this limitation, the mind of the commander must decide what specific information will ensure

development and maintenance of a mental vision of the battlefield. The commander's mind is the tool that allows him to draw upon that vision in any situation, mission, or environment. Therefore, the commander must raise himself above the volumes of detailed information that could be reported to him. His mind must identify and obtain those few critical pieces of information that will verify, modify, or change his mental vision of the battlefield.

How the commander expresses his information needs is termed Commander's Critical Information Requirements (CCIR). CCIR communicate information that the commander needs and considers critical to determining a course of action. CCIR is a tool to ensure that information transmitted to the commander is meaningful and readily recognized as critical to his mental vision of the situation.

The objective of this monograph is to decide if emerging doctrine adequately defines and describes CCIR so that it can be a usable tool for future battle commanders. CCIR focuses not only on limited intelligence collection resources and information communication systems, but also on the cognitive capabilities of the commander's mind.

The first part of the monograph analyzes the doctrine of CCIR found in current U.S. Army field manuals. The intent is to determine if a proper definition for CCIR exists and if it correctly

describes the environment of information in which it operates. This part looks at current guidance regarding the use and communication of CCIR.

The second part of the monograph deals with the mind of the commander. The human mind is limited by the amount of information that it can receive, analyze, and make decisions about under stress. Known as "bounded rationality," this concept applies to commanders in combat organizations who must make decisions by separating critical information from routine data. Doctrinal implications of this concept will be summarized.

The third part of the monograph studies past tactical commanders and their use of critical information requirements. Specific commanders of U.S. Army corps and division-size units in battles during World War II and Operation Desert Storm designated certain essential information. Their focus for CCIR gives direction in determining future critical requirements for information. Their actions show how technology has changed their focus. Lessons will be drawn from each commander's use of CCIR and doctrinal implications will be summarized.

The fourth part of the monograph looks at emerging doctrine, which defines CCIR and establishes principles for its use by U.S. Army commanders and staffs. The monograph critiques emerging doctrine using the specific lessons of bounded rationality and history.

With these lessons in mind, the monograph concludes with recommendations as to the direction the doctrine of CCIR should take.

THE DOCTRINE OF CCIR

Tactical commanders have identified those information requirements they have considered critical to success since the history of war began. The works of Frederick the Great, de Saxe, and Napoleon all include references to the commander requiring essential or critical information for decision making. Only recently has our doctrine recognized the importance of the commander identifying critical information to his subordinates.

Until 1976, the trend in the U.S. Army was to place responsibility for information management under the purview of the intelligence section of a headquarters. The perception was that most information available to the commander concerned the enemy.

The operations doctrine of 1976 recognized two different types of information -- combat information and intelligence.[6] Combat information was raw data that could be used as received. Intelligence was raw data that required analysis before use.

In 1984, the U.S. Army published an updated FM 101-5, Staff Organization and Operations. The manual designated the commander's staff as responsible for distributing essential information.[7] It explained that awareness of the situation, knowledge of the intent of the commander, and good judgement combine to guide a staff officer in what to tell the commander. It

specified that the staff keeps the commander informed which, in turn, enables the commander's prompt decision making.

The manual cautions commanders as to the risk of information overload. It remarked that there is a tendency for decision makers to request and analyze too much information. It warned that choices must be made on the information communicated to the commander.

A review of FM 71-100, Division Operations, places CCIR as a product of the Intelligence Preparation of the Battlefield (IPB) process.[8] It designates Priority Intelligence Requirements (PIR) as enemy force oriented. CCIR are for friendly force reporting requirements only.

The 34-series of FMs lend more uncertainty to defining CCIR. Within this series, PIR are the expression of a commander's needs.[9] PIR are to focus on meeting the commander's essential requirements for information.[10] Although the commander decides intelligence requirements, the FM series tasks the G2 to develop and submit PIR to the commander for approval. The information given to the commander goes through filters. The manual identifies the event and decision support templates as two specific products that information filters through before presentation to the commander.[11]

Based on this review of doctrinal publications, no comprehensive doctrine for identifying CCIR exists.

Only a few references to it can be found, with the end result being that CCIR remains virtually unrecognized as a doctrinal concept causing confusion in terminology. In finding a solution for this confusion, doctrine must first recognize the characteristics and capabilities of the tool used by a commander in deciding CCIR -- the mind of the commander.

THE MIND OF THE COMMANDER

The mind of the battlefield commander is presented with amazing challenges. It must find answers to complex problems with a minimum of information. On the battlefield, the commander's mind becomes surrounded by all of the elements of chance, chaos, human emotion, and uncertainty. These elements could cause the commander's mind to lose focus. Yet, it is with this mind that the commander must determine the information that is critical to reducing the battle's uncertainty and allowing success.

Liddell Hart once remarked that ". . . battles are lost and won in the mind of the commander . . ."[12] To achieve victory in battle, a commander must use his mind as the tool to cut through the fog and uncertainty of battle that surrounds him. His mind must quickly recognize the essential truths that will enable success in battle and define the information requirements that will verify those truths. If the mind is to be his tool for achieving victory, then the commander must understand how the mind's architecture can enable him to achieve that victory.

The central element of the mind's ordering is intellectual thought. The engine of this intellectual activity is cognition, the art of knowing. It includes the simultaneous awareness and judgement that occurs in the mind. Cognition is the act of the mind constantly

retrieving buried pieces of information in the subconscious, that relate to knowledge and experience, and instantaneously blending it with new information.[13]

Memory or information storage within the mind is the key to cognition.[14] It points out the signposts to guide the mind in thought and relates previous observations for use in the mind's reflective thinking. The construction of the mind's cognitive abilities requires years of education, training, and experience. From these experiences, the mind's cognitive capabilities collect memories and perceptions.

Perception is the way that the mind reads sensory signals from the environment.[15] It produces intelligent analytical and intuitive analogies from the mind's rich memories collected over time.[16] Perceptions are first impressions modified by education, training, and experience. As Napoleon said, perception is everything in war.[17]

Through its experience in life and with its baggage of memories and perceptions, the mind develops two different realms of intelligent thought.[18] These are the analytical and the intuitive realms.

The analytical realm concerns the use of logic, analysis, and detailed description to judge reality. Use of the mind's analytical power results in the creation of a picture without recognition or consideration of the picture's effect on the various elements that compose it. Analytical thought uses

objective information, is convergent in its path of thought, and results in a scientific, logical solution to a problem.[19]

The intuitive realm is "the alleged power of the mind to perceive or see certain self-evident truths."[20] Intuition is an ability to see form and its effect on all of its elements without scientific analysis.[21] It uses subjective information, is divergent in its path of thought, and creates original ideas.[22] It does not require logic or reasoned thought to produce ideas and solutions.[23]

The blending of the mind's analytical and intuitive powers enables a cognitive quality called, by the French, coup d'oeil.[24] It, like any other cognitive characteristic, exists in differing levels of ability.[25] Coup d'oeil enables "the quick recognition of a truth that the mind would ordinarily miss or would perceive only after long study and reflection."[26] It is maximized cognition that enables awareness using a combination of empirical and factual knowledge.[27]

A commander's mind with such capabilities should be a remarkable tool. One could think that the mind could easily see the truth. Yet, the commander's mind, under the stress of combat, exists in an environment surrounded by what Clausewitz described as the fog of war. This fog severely degrades the mind's remarkable capabilities and causes it to loose its focus on a mental vision of success. Stress and information

overload are two major types of fog on the battlefield that influence the commander's mind.

Stress is the first type of fog caused by combat. Commanders manifest this stress in many ways. Fatigue, forgetfulness, frustration, and tension are just a few.[28] Dependent on the degree of stress, the cognitive abilities of the commander will be limited to some degree.[29]

When stress is high, the commander's mind can overlook information that is critical to seeing through the fog and obtaining certainty.[30] Also, it perceives fewer elements in the environment.[31] Because of this, perceptions of what is occurring become distorted.[32] In the commander's mind, this can be compounded if incorrect perceptions exist from the start.

This stress causes the mind to think that its focus is incorrect. Attempts to relieve the stress create information requirements in the commander's mind that are irrelevant to the situation.[33] Relief from stress becomes the goal of the mind's cognition instead of obtaining a true mental vision of the battlefield.

Information overload is the second type of fog. Crisis, normal in any battle, creates limitless amounts of information.[34] This unbounded information flow can cause commanders to lose focus of what is important in a maze of facts.[35]

Overload of the mind with information causes tunnel vision, fixation, and loss of focus.[36] The mind

omits important information to allow room for more information.[37] Integration of new information with previous mental decisions does not occur.

The combined effect of stress and information overload could result in the commander's mind having limited cognitive abilities, false perceptions, and loss of focus. His mind becomes prone to accepting satisficing (choosing the first alternative that meets the decision criteria) over optimizing (finding the best alternative).[38] The commander loses his cognitive ability to blend all of the possibilities into the best solution.

The challenge for the commander is to reduce the combined effects of stress and information overload to maintain a mental vision of the battlefield. If, as Liddell Hart stated, battles are decided in the mind of the commander, then the commander cannot allow his mind to wander unfocused in the fog of battle. He must recognize that fog exists in every battle. The commander must therefore take precautions to reduce this fog, so that his mind can operate at its maximum cognitive potential.

General Helmut von Moltke, Sr., understood this limitation placed on the commander's mind.[39] He knew that, as a commander, he could do nothing to remove the physical stress inherent to a battle. It had always existed and would continue to be a part of every battle. Therefore, the answer was not to require new

controls or more information. Instead, Moltke reduced the information he needed in order to allow his mind to perform at its maximum cognitive potential.

Moltke apparently recognized the basis for the current concept of bounded rationality. This concept recognizes that, under stress, the human mind's ability to generate alternatives, process information, and solve problems has limits.[40] Its finding is that there is an upper limit on the rate at which decision makers can process information satisfactorily.[41]

Understanding bounded rationality helps decision makers recognize that they are cognitively constrained.[42] The crisis of battle restricts the commander in how much information his mind c n absorb in a given period, the amount and quality of alternatives considered, the ability to foresee the consequences of a course of action, the application of memory and perception, and other cognitive efforts required in decision making.[43] Bounded rationality is a major determinant of the human mind's performance levels in information processing.[44]

Researchers have found that decision making performance under stress declines in its effectiveness when the number of informational indicators approach or exceed approximately ten items.[45] This means that commanders may ask for all the information that they want. However, bounded rationality would predict that

their cognitive capabilities under stress can process only a small amount of that information.

In battle, the commander's mind, with its limited cognitive abilities, faces an environment unlimited in information, stress, and human emotion. This environment serves to entangle his mental vision and judgement. Based on his experience, Clausewitz observed that, "A sensitive and discriminating judgement is called for; a skilled intelligence to scent out the truth."[46] To create this, a commander must recognize the concept of bounded rationality in the creation of his mental vision of victory. He must focus his information requirements to allow the discriminating judgement of his mind to confirm his mental vision and act accordingly.

Compensation for the mind's bounded rationality is not an easy task. A commander must develop techniques to enable his mind to do this. There are some proven techniques for a commander to use in developing a mind capable of sensitive and discriminating judgement.

Napoleon's superior understanding enabled him to see distinctly and clearly the course of action in his mind.[47] The basis of this superior understanding was training and practice.[48] Memory absorbs the experience produced by training. Experience blends with the mind's intuitive and analytical abilities. Therefore, a commander's cognitive skills for war can be enhanced by correct experiences in combat or training.[49] Short

of actual combat, command post exercises, field exercises emphasizing the decision making process, and the Battle Command Training Program for corps and divisions all provide examples of training commanders in correct experiences. Clausewitz notes that: "Practice and experience dictate the answer: this is possible, that is not."[50]

Another method to use in developing a superior judgement is indoctrination. This is a common cognitive basis for understanding and judgement among organizational members refined from professional experience.[51] It instills consistent routine responses within the organization that the commander needs to ensure his mental vision of the battle is maintained.[52] An example of this is a CCIR (such as reporting when the attack helicopter battalion goes below seventy-five percent in available attack aircraft) that could be included in the organization's Standard Operating Procedures.

The final method for dealing with bounded rationality is the chunking of information. This is a melding of the working memory of the mind with long term cognitive memory.[53] A larger volume of information processing is possible because the mind blocks like-information together in like-categories. One piece of information received may trigger or relate to a chunk of affiliated information. For example, the commander designates the location, activity, and

movement of the enemy tactical reserve as a CCIR and chunks all information he receives in a battle that concerns that force.

These techniques help a commander's mind to decrease the limitations of bounded rationality. Training and practice enable the attainment of mental experience in techniques to overcome the fog of battle in the commander's mind. Indoctrination allows the commander to develop a shared mental vision with his subordinates. Chunking allows the commander to increase his capacity for receiving and processing information.

The use of these techniques will not remove all the limitations on the commander's mind. Clausewitz recognized that the fog of war would always exist in some degree to prevent the commander from clearly seeing the true picture.[54] Clausewitz's solution was to arm the mind permanently. The analysis presented shows that the mind of the commander, in order to become permanently armed, must recognize the following lessons.

The first lesson is to remember that the commander's mind can absorb, process, reflectively think upon, and act upon only a few pieces of information simultaneously. The commander must carefully and reflectively think of the critical information that he requires to allow his mind to perform at its maximum cognitive potential. He must

therefore limit his CCIR to around ten items of information.

The second lesson is that the commander, as part of his decision making process, must expeditiously develop a mental vision of how he anticipates the battle to evolve. This is extremely important today when the commander normally can see only a small amount of his assigned battle space.[55] That mental vision directs the commander's cognitive abilities in its acquisition of information and application of that information to decision making.

The third lesson is that uncertainty will always exist on the battlefield. The information available for a decision during the battle never equals the information required for a perfect decision in a battle.[56] The cognitive limitations of a commander will not allow him to absorb all the information required for a perfect decision. The commander must recognize that an untrained mind threatened with an uncertain situation demands more information to make a decision. The only proven method to focus the mind is to develop a sensitive and discriminating judgement.

The fourth lesson is that the fog of battle can invade the mind of the commander in the forms of stress and information overload. Stress will always be present in battle, but information overload will exist only to the degree that the commander allows it. FM 71-100-1 recognizes and suggests that, to be effective

in a crisis, the commander must limit the number of voices he hears.[57] He must use filters in the form of CCIR to prevent the limitless information that the command and control system data bases and subordinates will make available from burying his mind's cognition.

The final lesson to be learned is that the mind deals in two realms of knowledge -- the intuitive and the analytical. Both are critical to the cognitive process. However, the commander must blend these realms into his coup d'oeil to achieve success. Clausewitz notes that, "The essence of good generalship is the commander's coup d'oeil, his ability to see things simply . . ."[58] Clausewitz recognized the realms of knowledge, but acknowledged that the essential cognitive quality was the blending of the creativity of the intuitive and the reasoning of the analytical. Only this blending would allow the quick recognition of the events on the battlefield and how these events would affect the commander's mental vision of the course of action. The only method available to the commander to achieve this state of mind is to use every opportunity to train his mind to blend the realms of knowledge to overcome the fog of battle.

History is rich with examples of commanders who have succeeded and failed because they have or have not been successful in seeing the battlefield. A short survey of recent commanders will point to lessons for doctrine and the development of CCIR as a command tool.

PAST TACTICAL COMMANDERS' DEVELOPMENT OF CCIR

Past masters of the art of command recognize that there is a link between their cognitive abilities and victory in battle. A study of the techniques used to determine critical information by ancient commanders such as de Saxe and Napoleon would be too difficult and would not consider the technology of the modern battlefield. The techniques used by successful corps and division commanders in recent wars characterized by technology and fast-paced operations give a better analysis of the concept. To obtain a variation of techniques used with differing technologies on different battlefields, commanders from World War II and Operation Desert Storm will be studied.

The commanders from WWII are Lieutenant General George S. Patton, Jr., during the invasion of Sicily and Major General John S. Wood during the breakout of Allied forces from Normandy. From Operation Desert Storm, Lieutenant General Frederick M. Franks and Major General Thomas G. Rhame will be analyzed.

The first subject of study is LTG George S. Patton, Jr., while in command of the U.S. Seventh Army in Operation Husky.[59] Patton was undoubtedly one of the finest commanders of large maneuver forces in the history of the U.S. Army.

Patton's early experience in cavalry coupled with his participation in the fast-paced action of the

Mexican expedition and his development of tank tactics in World War I shaped his mind for maneuver warfare. His personal doctrine, ingrained in his memory and valued in his perceptions, was a quest for the speed and mobility of the old sweeping cavalry style.[60]

Patton was the commander of U.S. ground forces in the Allied invasion of Sicily. The plan designated the British Eighth Army as the main effort. Patton and the more than 90,000 soldiers of the U.S. Seventh Army, as the supporting effort, protected the British left flank.[61]

Facing the Allied invasion was the Italian Sixth Army's 200,000 men and four divisions centrally located for quick reaction to threatened sectors.[62] Attached to the Sixth Army were 50,000 German troops composing two divisions prepared to counterattack invading forces where necessary.

Patton's Army quickly went ashore and, within two days, repelled a major counterattack by the Axis forces designed to throw the Allied invasion into the sea. During his reflective thinking on the course of action for the invasion, Patton had anticipated that the enemy would attempt to counterattack the invasion with at least two divisions.[63] He believed this was the only major attack the enemy could organize in Sicily.[64] The two division counterattack verified Patton's mental picture of his course of action.

Patton considered his supporting role unsatisfactory and subsequently revised his mental picture. He recognized that a frontal assault against prepared enemy positions with no terrain available for maneuver was impossible along the limited road net. His principles of speed and mobility, products of his training and experience, prompted him to take advantage of the tempo of mobile warfare.

Palermo, a seaport and major transportation hub for the island, with its open plains provided the objective for Patton's attack. He requested permission to attack and received conditional approval with certain limitations.[65] He could only attack if it would not cause a major engagement.

With this in mind, Patton quickly turned to his staff. He had trained his staff to quickly provide him with non-routine information that he wanted to know.[66] In preparing for his attack on Palermo, he asked his staff: "If I attack . . ., will I bring on a major engagement?"[67] His staff dissected this one question into a series of other questions, primarily enemy oriented (PIR). After gathering the necessary facts, their answer to Patton was, "No, Sir."[68] Because of their training and his focus on only essential information, Patton's staff did not clutter the commander's mind with unnecessary information that would distract him from his mental vision.

The resulting attack on Palermo unhinged the Axis defense and assured a swift victory for the Allies in Sicily. Patton went on to even greater victories in Europe.

The second subject of study is Major General John S. Wood, the commander of the 4th Armored Division from April 1941 to December 1944 in the European Theater. Despite a reputation as "the Rommel of the American armored forces . . . one of the most dynamic commanders of armor in World War II," Wood never received the respect due for his accomplishments.[69] He led the 4th Armored to become one of the most feared and respected units in the European theater.

Wood's training for this task started early in his life. The sport of football enabled him to practice decision making under the stress of victory or defeat in games filled with uncertainty.[70] His efforts rewarded him with a quick-thinking, agile mind that could create a mental vision of success.

His initial service in the U.S. Army allowed him to see the futility of WWI's trench warfare and the potential of armored forces in combat.[71] The power of maneuver and mobility found in mechanization reminded him of the contest of maneuver he practiced for years on a football field. His assignments, experiences, and mentoring that followed his initial service continued to school him in maneuver.[72]

From the day Wood took command of the 4th Armored, his vision was to create a division that would optimize its capabilities of speed, mobility, and firepower. He strove to indoctrinate each leader and soldier in that vision, empowering them to act within his intent.

Wood's mental vision linked his requirements for essential information to the critical capabilities of the division. Patton taught him that: "Information is like eggs; the fresher the better."[73] He envisioned two methods to obtain such information. The first was to command from the front where he could see things happening for himself.[74] Second, he used training to indoctrinate simple, yet essential information requirements (CCIR) into the division.[75]

He had four essential information requirements that he trained his division to respond to.[76] First, where was the enemy strength located (to include tanks, antitank guns, and obstacles)? The division's objective was to bypass strength and take the indirect approach to penetrate deep into the enemy rear areas. Second, were adequate road networks available to support movement, maneuver, and resupply? This was critical to the division maintaining speed and tempo. Third, were adequate fuel stocks available? This was the only thing that could limit the division's action. Fourth and last, were resources available to prosecute the attack (i.e., artillery, engineers, task organized forces, reconnaissance)? Correct force mix was

essential to building the shock action and independent maneuver capabilities of the division.

Wood worked to ensure that his organization shared his mental vision of the battlefield. He used the staff primarily to maintain contact with the combat commands and himself and to enforce his instructions in supply and maintenance.[77] He expected his staff to be innovative and to follow his example of agility.[78]

The breakout of Allied forces from the Normandy beachheads showed Wood's mental and physical agility. In July 1944, the 4th Armored spearheaded Operation Cobra into the Brittany peninsula.[79] Under the Operation Overlord scenario, Wood's assigned objective was the Brittany ports. Commanding from the front, Wood noted that the German left was crumbling and their forces were retreating east.[80] Wood's mental vision quickly noted a need for a change from the original mission to a strategy of encirclement.[81] This set up the perfect conditions for what he had trained his division to do -- the pursuit.

Wood did not want to get into a slugging match with defended ports that he felt were no longer important to the overall strategy. Also, attacking the ports did not allow him to optimize the capabilities of his division.[82] His essential information told him that the enemy strength was in the ports, that the road networks were available going toward the east, and that

adequate fuel and resources were available to pursue the fleeing German Army.

As the division prepared to clear Rennes, a major transportation hub, Wood tried to convince his commander that the corps orientation was on the wrong objective. It was ten days before the Corps reoriented 4th Armored toward Paris. Once released, Wood became "the architect of the rampage through France."[83] The 4th Armored's drive lasted seven weeks and culminated due to a lack of fuel. Wood and the 4th Armored earned lasting honors from the Allied armies and fear and respect from the Axis armies for this drive through France.

These two great commanders of WWII recognized the limits of their mental powers and planned accordingly. Their emphasis on essential information helped them to command successfully. Unfortunately, doctrine has not adequately captured the lessons of their command styles.

Since WWII, information technology has changed drastically. It has given modern commanders a much greater capacity for information gathering. During Operation Desert Storm, commanders possessed the technology for information management, but not necessarily the doctrine to guide them in its use. How select commanders elected to determine CCIR should give insight into how future battlefield commanders and doctrine could identify and use CCIR.

LTG Frederick M. Franks, Jr., commanded the VII U.S. Corps during Operation Desert Storm. Despite his seemingly mild ways, Franks was a top-notch leader with a powerful tactical intellect and unbending will.[84] He proved to be a master of mobile warfare.[85]

Franks trained early in his career as an armor officer. Subsequent assignments and his tour as the operations officer for the 11th Armored Cavalry Regiment in Vietnam instilled in his mind the value of mobility, speed, and shock action. It also gave him experience with the stress of combat and its effect on command.

The mission given to Franks and the VII Corps was to rapidly penetrate the forward Iraqi divisions west of the Wadi al-Batin and to move swiftly north to turn the flank of and destroy the Republican Guards (RG).[86] Facing the corps were three defensive belts containing up to nineteen enemy divisions of which eleven were possible mechanized divisions. Franks' intuition told him that only a swift-moving offense using the mobility and shock of his corps would create the conditions necessary for success.[87]

Franks' decision making process had two major steps.[88] First was reflective thinking in which he formed a mental vision of his course of action. Second was to act decisively to achieve his vision.

As Franks worked within his mental vision, he followed an action-reaction routine as he wargamed the

course of action.[89] From this, he determined how the enemy could interfere with his course of action and formulated decision points that related critical points in the battle to his mental vision.

For these critical points, Franks developed CCIR that had a direct impact on his mental vision. Within the corps headquarters, he called these requirements 'key reads.'[90] He assessed that in a battle in which the corps was maneuvering over long distances, the corps' technical resources for information collection would be limited in the amount of information that could be realistically collected, analyzed, and reported. Therefore, Franks limited his key reads to "around six items."[91] Lastly, he ensured that subordinates knew those key reads.

Franks' action-reaction wargame foresaw the RG, his primary objective, either counterattacking the corps, continuing to defend, or withdrawing to other defensive positions near Basrah. The vision he created and shared with his subordinates was flexible enough to adapt to any one of the possible enemy courses of action. The main piece of critical information that he wanted was the location and actions of the RG. When his ACR found the RG prepared to defend, he already had the mental vision that allowed the corps to immediately achieve success.

Franks' disciplined mind was a key ingredient to the success of the VII Corps. His swift-moving attack

against three echelons of Iraqi forces resulted in the defeat of the pride of the Iraqi army and a major victory for the U.S. Army.

The final subject of study is MG Thomas G. Rhame who commanded the 1st Infantry Division (Mechanized) during Operation Desert Storm. With his common sense leadership style, Rhame was a polished commander, calm and reassuring to his soldiers in combat. He proved to be expert in balancing command and information.

Rhame is an infantry officer that developed an appreciation for the speed and mobility enabled by heavy maneuver forces. A cavalry troop command in Vietnam provided him with combat experience in fast-paced maneuver and prepared him for the stress of the battlefield. Combined with his subsequent assignments in armor and mechanized units, he brought a rich experience in maneuver warfare to his division.

VII Corps designated Rhame and the 1st Infantry as the Corps main effort for the initial attack.[92] His mission was to penetrate and defeat the first-echelon enemy forces in zone and to pass VII Corps forces through that penetration. On order, the division reverted to Corps reserve.

The basis of Rhame's decision making process was to form his own mental vision of the course of action separate from his staff. He used his reflective thinking to guide his subordinates so that they worked within his intent. He believed that identifying

critical information was commander's business, not a staff function.

Rhame also understood the battlefield he was to operate on. Despite advances in information management systems, the best information was not at the command post. The high technology information systems at the command posts depended on other information systems in the Corps that were maneuvering and therefore were not available for information. It was near the front where he kept his command group. This enabled him to see the battle and obtain the most current information. Like Wood, he believed that hearing about the situation while located in a command post only ensured it was too late to do anything about it.[93]

Rhame also wanted to limit the number of voices he heard during battle. He had an Assistant Division Commander for Maneuver, an Assistant Division Commander for Support, and a Chief of Staff that he made responsible for operating the division's command posts. He expected them to act as processors and filters for information, giving him what he needed to know. Sitting at a command post would only usurp their authority and make staff officers feel that they should tell him about their functional areas.

Rhame recognized that a commander under stress has cognitive limitations. He knew that information overload only served to cause a loss of focus, despite the recipient. He, as commander, focused his efforts

in line with his cognitive limitations. Therefore, he limited his CCIR to ten or less items.[94]

Rhame recognized that the Corps commander wanted to conduct the initial breach of the Iraqi front line and then execute a branch of the plan in which the 1st Infantry became part of the armored fist attacking to destroy the RG. He developed his mental vision of a course of action that would achieve that end. One CCIR that he linked to this was whether the front-line enemy forces at the breach site conducted an organized indirect/direct fire fight. This would have caused him to change his mental vision. He would have to commit his reserve early, delay the passage of follow-on forces, and accept increased loss of combat power.

As the 1st Infantry executed their attack, no fire was received from the enemy's major ground or air weapon systems at the breach. Only sporadic small arms and light antitank weapons fire resisted the division's efforts. By the enemy's lack of organized resistance, Rhame verified his picture of the battlefield. His recognition of the realities of the battlefield served to focus the combat power of the division. Because of this, the division was capable of rapidly continuing the fight. The 1st Infantry successfully led the VII Corps in its defeat of the Iraqi Republican Guards.

These two successful commanders of Operation Desert Storm built their CCIR not with technology, but with their minds. Their emphasis on CCIR helped them

to focus cognitive skills and limited information systems on their mental vision of the battlefield and raise themselves above the fog of war. Despite a substantial change in information technology, LTG Franks and MG Rhame both followed similar cognitive processes as LTG Patton and MG Wood.

As future commanders of divisions and corps train for battle, they must recognize that past tactical commanders used CCIR to achieve victory. These past commanders demonstrate that the mind creates the vision for victory. A doctrine for CCIR should recognize the lessons that these past commanders have learned and the principles they used to create CCIR that assisted in creating success.

A CRITIQUE OF EMERGING DOCTRINE

Successful commanders in the past have used a concept similar to CCIR to remove the fog of war inherent in the use of information on the battlefield. Currently, the U.S. Army does not recognize CCIR as a coherent concept. However, it is now preparing to unite the disjointed attempts to define CCIR into an integrated doctrine. This part of the monograph looks at this emerging doctrine and provides an analysis of the guidance it provides to future commanders.

In July 1992, the U.S. Army published a coordinating draft update of FM 101-5, Command and Control for Commanders and Staff. This publication recognizes for the first time the requirement for information management within tactical organizations. It also attempts to define CCIR, establish CCIR in an environment of information, and prescribe responsibilities for information management.

The first and most noticeable change in the emerging doctrine is the inclusion of a definition. CCIR are "unknown (but needed) information of such critical importance to a commander's decision making process that they directly affect the successful execution of operations."[95] The key question to be answered is: "What does the commander need to know in a specific situation to make a particular decision in a timely manner to retain the initiative?"[96]

Vast quantities of information are now available to a commander. To separate CCIR from other information, the operative description in the definition is "critical importance." CCIR is a product of the commander's decision making process. It is the commander's tool to help guide his command and control systems in using limited resources and time to produce the information critical to his decision-making process. It enables the commander to confirm, deny, or modify his course of action to achieve success.[97]

The second major step of the emerging doctrine is to transform two categories of information (combat information and intelligence) into three categories of combat information -- routine information, CCIR, and exceptional information. Routine information is information that does not affect the successful execution of an operation.[98] It is the normal information reported to and managed by the commander's staff. It is prescriptive in nature, usually driven by a unit's standard operating procedures.

CCIR is information that affects the successful execution of operations. The staff publishes CCIR to subordinates with the requirement that it is reported directly to the commander. It is dynamic, orienting toward current and future operations, and changing with the mission.[99]

According to the emerging doctrine, there are three groups of information within the category of

CCIR.[100] The first is Priority Intelligence Requirements (PIR) or what the commander wants to know about the enemy. The second is Essential Elements of Friendly Information (EEFI) or how the enemy sees the commander and his forces. The last group is Friendly Forces Information Requirements (FFIR) or the commander's operational status.

Exceptional information is information that immediately and directly affects mission accomplishment.[101] It is information produced because of an unforeseen or unexpected event and the commander must know it without delay. Awareness of exceptional information could enable success or produce failure on the battlefield.

A third major step of the emerging doctrine is that it emphasizes control over command. It states that commanders can dominate the dynamics of combat power through control.[102] The control philosophy is inherent in developing CCIR. The emerging doctrine specifies that normally the staff develops CCIR during the war game process and then modifies the CCIR to support the commander's decision.[103] However, this conflicts with the intent expressed in the definition of CCIR which states that commanders develop CCIR.

The fourth major step of the emerging doctrine gives the commander groups of possible CCIR to select from based on his information needs.[104] Examples shown include the locations and capabilities of signal nodes

and status of EPWs and refugees. The groups resemble a pre-chunked database that the commander can select from based on the mission and situation.

Based on this review of emerging doctrine, there are six points of criticism. The material presented in the previous parts of this paper give the basis for critique.

The first point of criticism concerns who is responsible for developing CCIR -- the staff or the commander. The emerging doctrine proposes that the staff develop and submit it to the commander for approval. Yet, the definition for CCIR says it is a part of the commander's decision making process. The commander must be deeply involved in the course of action development and not dependent on his staff to do this for him. The major criticism of emerging doctrine is that the staff is doing the commander's job.

If CCIR are requirements from the commander, then its development must be a product of the commander. Depending on the decision making style of the commander, the staff may recommend CCIR or changes. However, the commander's cognitive abilities should decide what information is critical.

Past tactical commanders demonstrated that their essential information requirements were a product of their reflective thinking and keyed to their mental vision of the course of action. The correct doctrine should be that CCIR is the commander's tool, a product

of his reflective thinking, and therefore the commander's job.

The second point of criticism is that emerging doctrine does not recognize any limitation in the commander's cognitive abilities to use CCIR. Since CCIR is a mental product of the commander, it is subject to the cognitive abilities of the commander's mind.

Researchers indicate that human cognitive abilities have limits. These limits apply to different commanders in different ways. When under stress, the commander will be able to absorb only so much of the information he receives. He must adapt his cognitive abilities to enable his mental vision to operate unrestricted by stress or information overload.

Several ways exist to improve cognitive skills. Improvements can be made by training and experience, which create useful memories and perception. However, these will not help the commander's mind escape all of the fog of war. The commander must determine the limits of information that his mind can process through practice or experience. Doctrine should recommend, as have past tactical commanders and researchers, that the commander limit his CCIR to ten or fewer items when in the stress of combat.

The third point of criticism is that the emerging doctrine prescribes CCIR as a database of available critical information for the commander to select from.

It appears to reduce CCIR to a problem to be solved by a scientific checklist. More dangerously it appears to be an attempt by the staff to control what is important to the commander by recommending the use of a detailed database. Nothing is farther from the truth.

Control concerns the efficient use of resources. It emphasizes the staff functions of process and bureaucratic caution.[105] It attempts to attain certainty or to know everything. J.F.C. Fuller warned that control can become "an all-controlling bureaucracy, a paper octopus squirting ink and wriggling its tentacles into every corner."[106] It can paralyze the courage of command. The certainty it attempts to achieve is a product of information, time, and resources. The commander never has enough of any one of the three.

This attempt to espouse control over command is dangerous. Control cannot dominate the dynamics of combat power. Conversely, command, which contains the primary dynamic of leadership, is incapable of a complete scientific solution.

The commander who depends upon a checklist to tell him what is important is the commander who does not recognize the realities of the battlefield. He has not reflectively thought through his course of action and linked CCIR to his mental vision. He allows the checklist or control apparatus to filter information

and tell him what is important instead of his mental image of the battle or his command apparatus.

Command is an art of creating order out of chaos. Each commander's mind has a unique method of doing this, residing in his memories and perceptions. Doctrine must recognize the futility of a standard scientific solution for an art such as command.

The fourth point of criticism is that emerging doctrine shows that PIR, EEFI, and FFIR all make up CCIR. However, these are results of a commander stating his CCIR to his subordinates and staff. The staff prepares PIR, EEFI, and FFIR in a scientific, sometimes checklist approach to dissect the commander's requirements into component parts that could make up the CCIR. Appendix D (Estimates) of the new FM 101-5 contains examples of this checklist approach. The staff's efforts aim at controlling operations and asking relevant questions in a logical analytical manner to filter into answers for CCIR.

Past tactical commanders prove that when a commander establishes a CCIR, he states a requirement for information. For example, a corps commander may state a CCIR as: "Tell me the minute that the enemy commits his operational reserve." This CCIR in turn causes the staff to create at least two categories of information. First is PIR that focuses on the enemy's operational reserve (such as identification of units, locations, composition, organization, morale, strength,

status of supply, and likely course of action). Second is FFIR that focuses on the status of friendly forces that could be used as the reaction to the enemy action (such as location and status of counterattack forces, MLRS, ATACMS, CAS, and attack helicopter assets).

Based on this process, PIR and FFIR may have many pieces or chunks of information that are critical to the staff managers of those requirements, the G2 and G3, who filter the information. The commander, like Patton and Franks, is not necessarily interested in specific PIR or FFIR. His focus is on the critical piece of information required to verify his mental vision that will enable success - the movement and subsequent destruction of the enemy's operational reserve.

Detailed information flowing through the organization should not interest the commander. He should only focus on having his CCIR answered. The commander, once under the stress of battle, cannot get embroiled in details. PIR, EEFI, and FFIR are detailed control information promulgated by the staff and should be recognized in the doctrine as such.

The last point of criticism is that the emerging doctrine states that the categories of information are routine information, CCIR, and exceptional information. The emerging doctrine shows no difference between exceptional information and CCIR, but states that the path of exceptional information goes directly to the

commander while the path of CCIR goes through a filter before it reaches the commander.

There are two issues which make these categories of information confusing. First, CCIR is not necessarily filtered information. The path of CCIR transmission is determined by the commander. He establishes, by the way he expresses his CCIR, whether it will be filtered or sent to him as raw information. As Patton illustrated, there are CCIR that cannot be answered without analysis by the staff. Conversely, CCIR may be information that the commander can use unfiltered, such as Rhame's determination of the enemy's organized resistance by leading from the front. The act of filtering depends upon the specific CCIR.

Second, by its definition, exceptional information is just as critical to the commander as CCIR. Both affect the successful execution of operations. Exceptional information is only a confusing doctrinal use of terms for unpredicted critical information.

There is no way to predict exceptional information. The 1984 version of FM 101-5 gives the only method for recognizing exceptional information. It says that subordinates must have knowledge of the situation, know the commander's intent, and possess good judgement.[107] Only knowledge of the exceptional fact, interpreted against the commander's intent, causes recognition of its criticality to the commander.

Based on the last two points of criticism, the doctrine should recognize three categories of information -- routine information (normally contained in a unit's standard operating procedures), control requirements (filtered information requirements found in the staff's PIR, EEFI, and FFIR), and CCIR (unfiltered or filtered information requirements to be reported directly to the commander that allow him to confirm, deny, or modify his mental vision of the course of action). This would include the current category of exceptional information and remove a possible confusing use of doctrinal terms.

The emerging doctrine for CCIR is a start in the right direction. However, it is not yet complete and is misleading in its call for control of information management versus command of it. The doctrine must be corrected and refined before distribution to the field.

CONCLUSION

Command on the battlefield has not changed significantly over time. It still exists in a fog of war, composed mainly of the human stress of combat and abundant information. Technology has increased the capabilities to capture and process information, yet commanders are no more capable today of dealing with limitless volumes of information than their predecessors.[109]

The commander must understand that the key to this problem is not in technology, but in his mind and its unique capabilities. The commander's cognitive capabilities blend intuitive and analytical skills with memories acquired in years of experience. In the mind resides the commander's vision for winning the battle.

Past tactical commanders, in recognizing this fact, created mental pictures of the course of action they intended to use to create success. Then they linked to this vision the essential information requirements needed to ensure victory.

CCIR was designed to be the tool that enables the commander to reduce the abundant information found in combat. It allows the commander to define his information needs which in turn focuses the efforts of subordinates in acquiring, processing, and filtering information.

The development of any doctrine is a dynamic process. Doctrine studies the lessons of the past and combines the lessons learned with the capabilities of the future in a disciplined evolution. In constructing a doctrine for CCIR, this dynamic process must occur as well. To be effective, doctrine must recognize where CCIR resides, how it was used in the past, and how future capabilities will assist commanders in identifying and obtaining CCIR. Lastly, it must integrate these in such a way to show future battle commanders how to use information to create victory on the battlefield.

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